

# JAPAN

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JIS D 9456 (2009) (English): Cycles -- Locks

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*The citizens of a nation must  
honor the laws of the land.*

Fukuzawa Yukichi

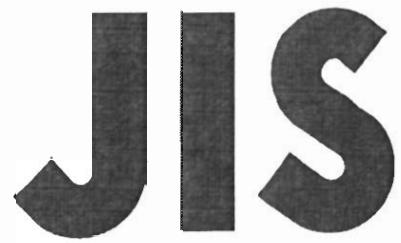
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**Cycles — Locks**

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## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Bicycle Promotion Institute (JBPI)/ Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS D 9456** : 1994 is replaced with this Standard.

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## Cycles — Locks

### 1 Scope

This Japanese Industrial Standard specifies locks to be used mainly for bicycles specified in JIS D 9111 (hereafter referred to as “locks”).

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS B 0205-1 *ISO general purpose metric screw threads — Part 1 : Basic profile*
- JIS B 0205-2 *ISO general purpose metric screw threads — Part 2 : General plan*
- JIS B 0205-3 *ISO general purpose metric screw threads — Part 3 : Selected sizes for screws, bolts and nuts*
- JIS B 0205-4 *ISO general purpose metric screw threads — Part 4 : Basic dimensions*
- JIS B 0209-1 *ISO general purpose metric screw threads — Tolerances — Part 1 : Principles and basic data*
- JIS B 0209-2 *ISO general purpose metric screw threads — Tolerances — Part 2 : Limits of sizes for general purpose external and internal screw threads — Medium quality*
- JIS B 0209-3 *ISO general purpose metric screw threads — Tolerances — Part 3 : Deviations for constructional screw threads*
- JIS D 0202 *General rules of coating films for automobile parts*
- JIS D 9111 *Cycles — Classification and essential characteristics*
- JIS H 8502 *Methods of corrosion resistance test for metallic coatings*
- JIS H 8610 *Electroplated coatings of zinc on iron or steel*
- JIS H 8617 *Electroplated coatings of nickel and chromium*

### 3 Classification

Locks shall be classified by construction as shown in table 1.

Further, side locks shall be used with another lock and shall not be used independently.



**Table 1 Classification of locks**

Classification	Figure number (Informative)
Ring lock	Figure 4
Wire lock	Figure 5
Chain lock	Figure 6
Side lock	Figure 7

#### **4 Names of parts**

The names of parts of the locks and examples of the main materials to be used are shown in figures 4 to 7.

#### **5 Shapes and dimensions**

The examples of shapes and main dimensions of locks are shown in figures 4 to 7.

The dimension which has no tolerances expression means the recommended value. The screws shall comply with **JIS B 0205-1** to **JIS B 0205-4**, and the limit value of tolerance and allowance shall be tolerance zone class 6H/6g or superior specified in **JIS B 0209-1** to **JIS B 0209-3**.

#### **6 Strength**

##### **6.1 Cyclic fatigue strength**

Locks shall be free from any abnormality in locking or unlocking when tested as specified in 10.1.

##### **6.2 Tensile strength of wire locks and chain locks**

Wire locks and chain locks shall be free from any breakage when tested as specified in 10.2, and shall be free from any abnormality in locking or unlocking.

##### **6.3 Static load test of ring locks and side locks**

Ring locks and side locks shall be free from any breakage or dislocation when tested as specified in 10.3, and shall be free from any abnormality in locking or unlocking. Ring locks shall be no disengagement of the joints of main body base and the case and be free from opening between the both parts.

##### **6.4 Corrosion resistance**

Locks shall be free from any abnormality in locking or unlocking when tested as specified in 10.4, and be free from any corrosion by rust harmful to use.

## 7 Structure

The structure of the locks shall be as follows.

- a) Locks with key shall be so constructed that they unlock by rotating a cylinder or moving a cylinder by the key as shown in figure 1, and shall not unlock without keys easily.

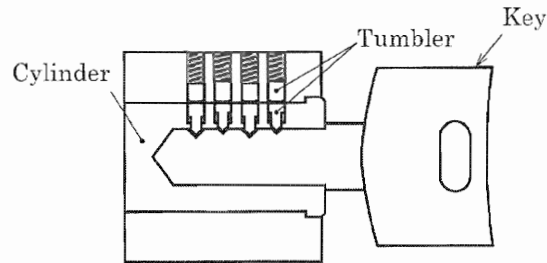


Figure 1 Structure of cylinder (one example)

- b) The side lock shall be so constructed that it will not easily be removed after being locked when attached to a bicycle.
- c) The lock which shows the functions as a lock by being attached to a bicycle shall be so constructed that it will not easily turn or slip off as it is attached.
- d) The side lock shall be so constructed that it will not easily be locked when the shackle is pushed with one action, but be moved the shackle to lock by another operation. Ring locks shall be so constructed that will not be locked when the shackle is pushed with one action, but it is preferable to be moved the shackle to lock by another operation.

## 8 Appearance

The appearance of locks shall be as follows :

- a) The portions appearing outside after assembling shall be free from sharp points, burrs, flashes, etc.
- b) The plated or painted surfaces shall be free from exposure of substrate, peeling off, rust and other visible defects.
- c) Marks shall be free from insufficient adherence, incomplete stamping, dislocation, etc.

## 9 Electroplating or painting

The portions appearing outside after assembling of a lock and not made of corrosion resistant materials shall be electroplated or painted, and their quality shall be as fol-

lows :

- a) The thickness of electroplating on iron substrate and the degree of corrosion resistance shall be grade 2 in table 2 specified in **JIS H 8617** or superior, or grade 2 in table 1 specified in **JIS H 8610** or superior. However, the threaded parts and corners are excepted.

Further, the uppermost layer of nickel-plated coating shall be applied chromium plating of thickness  $0.05\ \mu\text{m}$  or over as required. Those chromium plated on zinc-alloy substrate shall be grade 1 in table 2 specified in **JIS H 8617** or superior.

- b) For the painted surfaces, when pencil scratch test is carried out using a pencil of F in hardness in accordance with **JIS D 0202**, breakage shall not occur on the paint film of test surface.

## 10 Test methods

### 10.1 Cycle fatigue strength test

Locks shall be repeated locking and unlocking for 3 000 times, and shall be checked by visual and tactical sensations that there is no abnormality in locking and unlocking.

Operations shall be carried out for every operable part involved in the locking and unlocking functions.

### 10.2 Tensile strength of wire lock and chain lock

Wire locks and chain locks which are completely locked, as shown in figure 2, shall be free from any breakage in any part and free from any abnormality in locking or unlocking operations when a force of 1 400 N is gently applied thereto using a round bar of 25 mm in diameter.

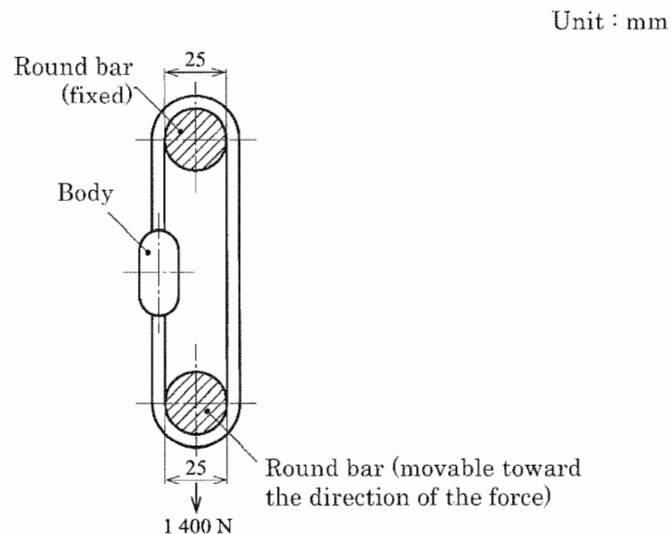


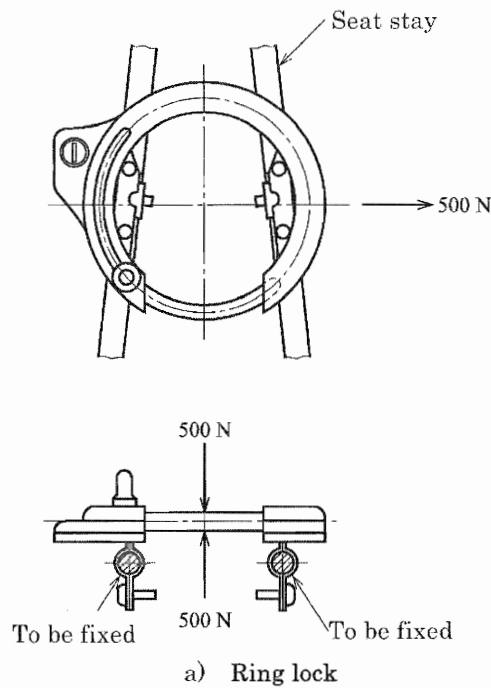
Figure 2 Tensile strength test of wire lock and chain lock

### 10.3 Static strength test of ring lock and side lock

Ring locks and side locks shall be attached to bicycles and locked as shown in figure 3, or locked in the similar condition, and shall be checked by visual and tactical sensations that there is no breakage or dislocation and abnormality in locking and unlocking, when loaded gently toward each direction as shown in figure 3 a) for ring locks and figure 3 b) for side locks.

A front fork of a bicycle to be fitted with the side lock shall have the structure to prevent any rotation or slipping off.

Unit : mm



Unit : mm

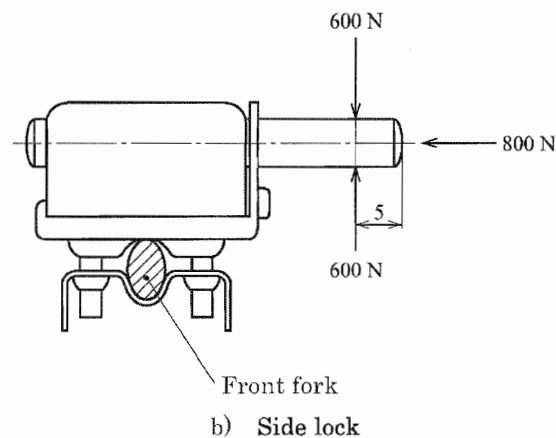


Figure 3 Static strength test of ring lock and side lock

#### 10.4 Corrosion resistance test

The corrosion resistance test of locks shall be tested for 72 h by the neutral salt spray test specified in **JIS H 8502** in the locked condition and shall be checked visual and tactical sensation that there is no abnormality in locking and unlocking and shall be free from any abnormality in locking or unlocking and be free from any corrosion by rust harmful to use.

#### 11 Designation of products

The products shall be designated by the Standard number or the “Lock for bicycle” and classification.

- |           |                   |           |
|-----------|-------------------|-----------|
| Example 1 | <b>JIS D 9456</b> | Side lock |
| Example 2 | Lock for bicycle  | Wire lock |

#### 12 Marking

##### 12.1 Marking on products

The following items shall be marked indelibly in such a manner as printing, punching, embossing, transferring printing or attaching name plate on the conspicuous place such as the surface of main body, seating and brace stud.

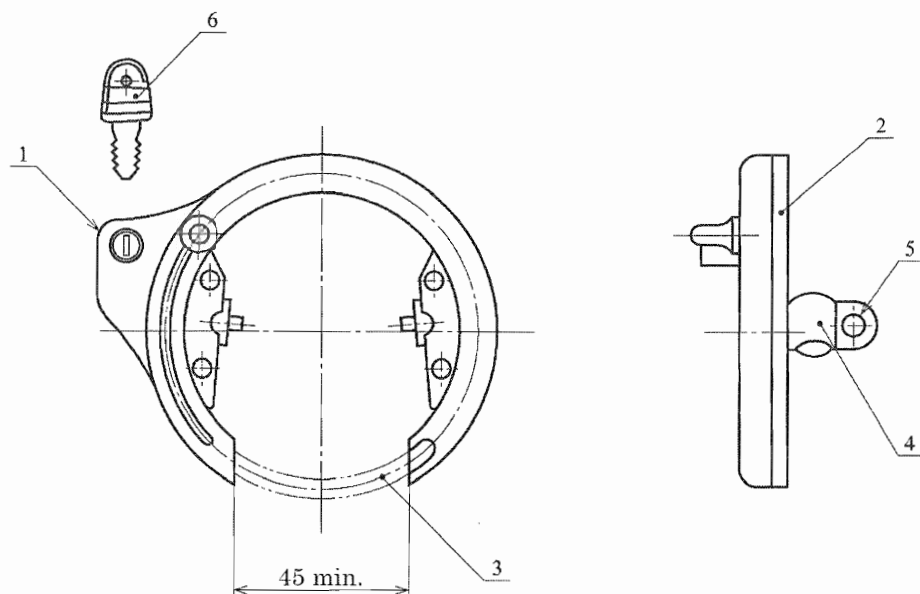
- a) Manufacturer's name or its abbreviation
- b) Year and month of manufacture or abbreviation thereof

##### 12.2 Marking on packaging

The following items shall be marked with printing, stamping, or attaching certificate stamp or tag on the package of locks, case, or header. However, in the case of commerce between the manufacturers, the marking of packaging may be omitted according to the agreement between the parties concerned.

- a) Manufacturer's name or its abbreviation
- b) Number of this Standard (**JIS D 9456**)
- c) As for side locks, the notice to be used with another lock and not to be used independently

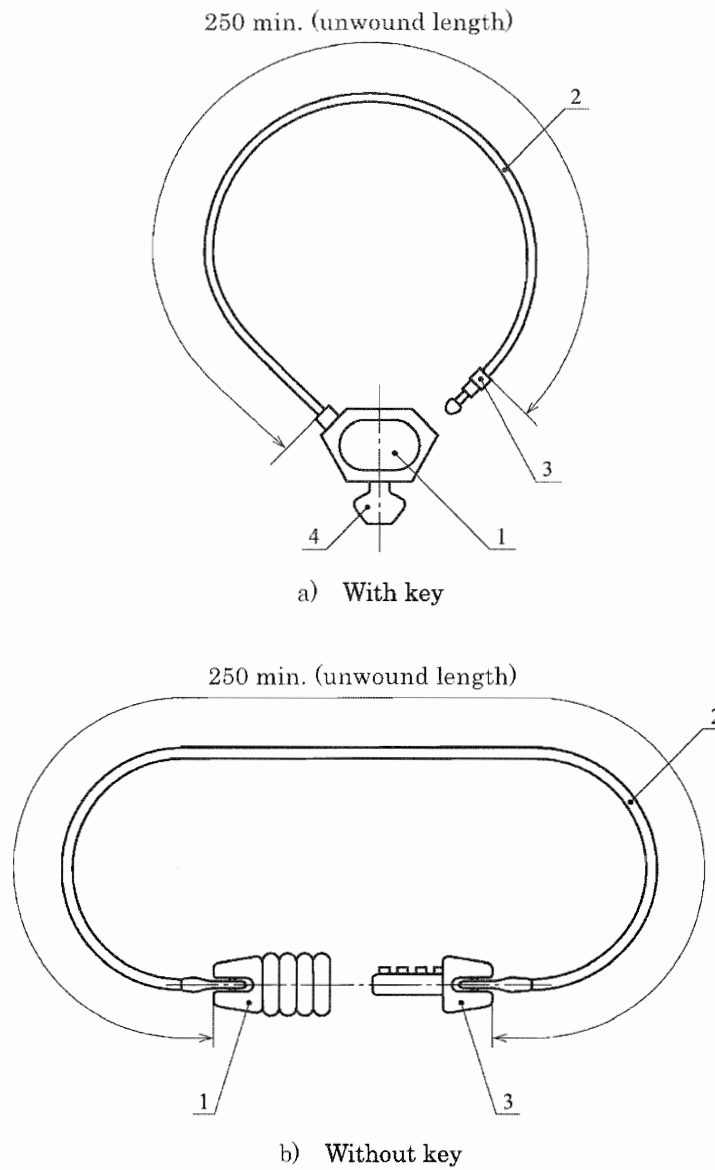
Unit : mm



Number	Name of parts		Main material (informative)
1	Body	Case	SPCC of JIS G 3141, synthetic resin
2		Base	SPCC of JIS G 3141, SPHC of JIS G 3131
3		Shackle	SPCC of JIS G 3141, SUM of JIS G 4804, SPHC of JIS G 3131
4	Fitting band		SPCC of JIS G 3141, SUS430 of JIS G 4305
5	Fitting screw		SWCH6R to 10R of JIS G 3507-2
6	Key		SPCC of JIS G 3141, C3710P of JIS H 3100, synthetic resin

Figure 4 Ring lock (one example)

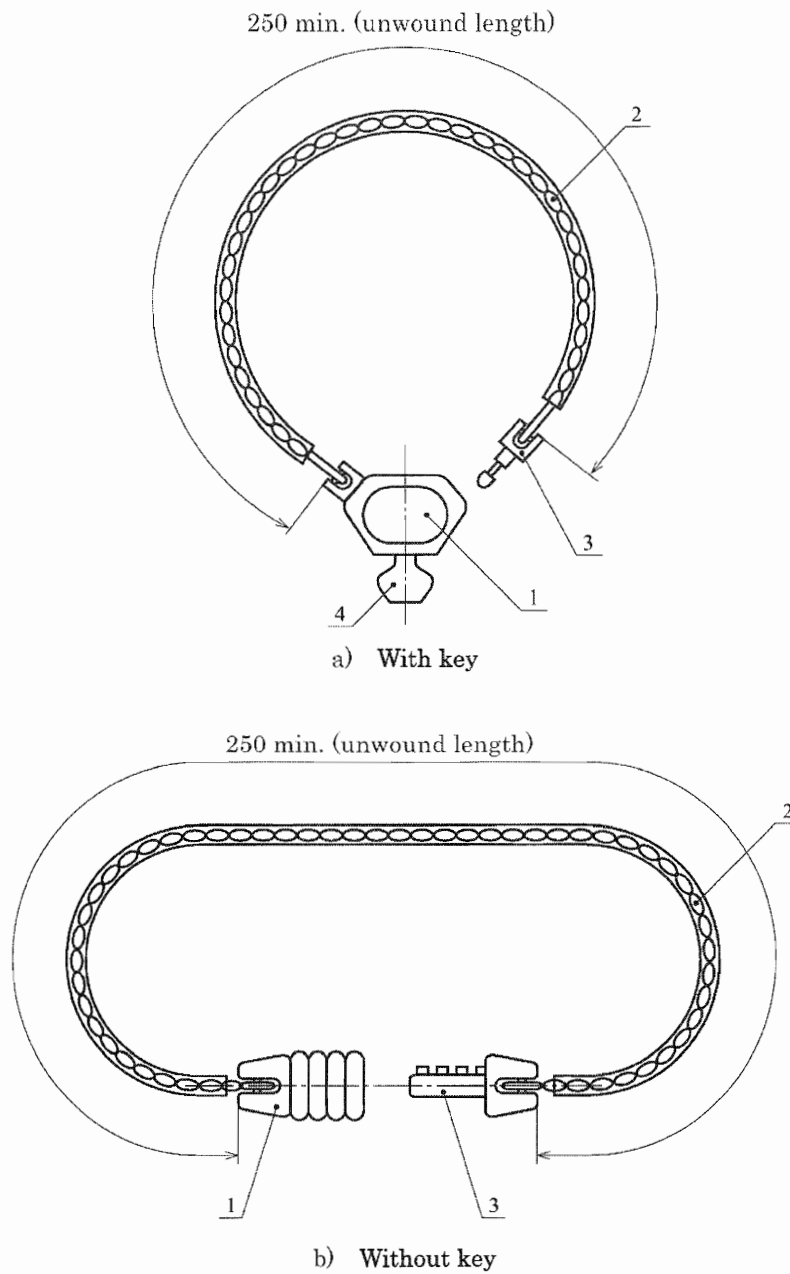
Unit : mm



Number	Name of parts	Main material (one example)
1	Body	SPCC of JIS G 3141, ZDC of JIS H 5301, synthetic resin
2	Wire	6 × 7, 6 × 19 and 6 × 24 of JIS G 3525
3	Brace stud	SUM of JIS G 4804, ZDC of JIS H 5301
4	Key	SPCC of JIS G 3141, C3710P of JIS H 3100, synthetic resin

Figure 5 Wire lock (one example)

Unit : mm



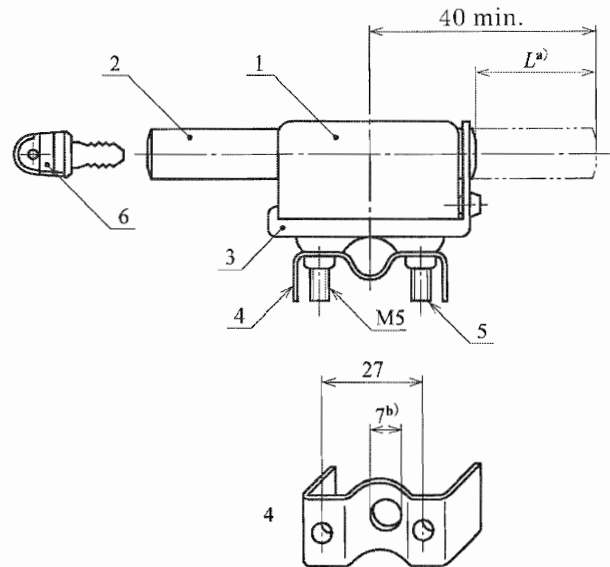
Number	Name of parts	Main material (one example)
1	Body	SPCC of JIS G 3141, ZDC of JIS H 5301, synthetic resin
2	Chain	SWM of JIS G 3532
3	Brace stud	SUM of JIS G 4804, ZDC of JIS H 5301
4	Key	SPCC of JIS G 3141, C3710P of JIS H 3100, synthetic resin
NOTE : Some chains are with tubes.		

Figure 6 Chain lock (example)





Unit : mm



- Note a) Working distance  $L$  shall, as a rule, be 15 mm to 30 mm.  
b) An example of rotation and slipping-off prevention. The rotation and slipping off are prevented by providing a convex portion to this hoke at the attaching position of a bicycle. The diameter of the convex portion shall be 6 mm to 6.5 mm.

Number	Name of parts		Main material (one example)
1	Body	Case	SPCC of JIS G 3141, ZDC of JIS H 5301, synthetic resin
2		Shackle	SPCC of JIS G 3141, SUM of JIS G 4804
3	Base	Bottom plate	SPCC of JIS G 3141, SPHC of JIS G 3131
4		Fitting	SPCC of JIS G 3141, SPHC of JIS G 3131
5		Fitting screw	SWCH6R to 10R of JIS G 3507-2
6	Key		SPCC of JIS G 3141, C3710P of JIS H 3100, synthetic resin

Figure 7 Side lock (one example)

### Bibliography

- JIS G 3131 *Hot-rolled mild steel plates, sheets and strips*  
JIS G 3141 *Cold-reduced carbon steel sheets and strips*  
JIS G 3507-2 *Carbon steels for cold heading — Part 2 : Wires*  
JIS G 3525 *Wire ropes*  
JIS G 3532 *Low carbon steel wires*  
JIS G 4305 *Cold-rolled stainless steel plate, sheet and strip*  
JIS G 4804 *Free-cutting steels*  
JIS H 3100 *Copper and copper alloy sheets, plates and strips*  
JIS H 5301 *Zinc alloys die castings*

Errata for JIS (English edition) are printed in *Standardization and Quality Control*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

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